

Regulation of Sewage Disposal Systems to Protect Surface Waters and Pond Water Quality

1. Purpose and Authority

- 1.1 The Brewster Board of Health (“Board”) concludes that the protection of surface waters in the Town of Brewster requires additional design requirements for septic systems within 100 feet of surface waters as defined in the *State Environmental Code Title 5* (310 CMR 15.00).
- 1.2 The Board also concludes that in order to preserve the lakes and ponds in Brewster and to protect public health, the nutrient (phosphorus) loading to lakes and ponds must be reduced. Existing sewage disposal systems have been identified as a source of nutrient loading to the ponds, and actions beyond those found in Title 5 must be undertaken to protect and restore Brewster’s ponds and to prevent harmful algal blooms that can impact public health.

The Board bases its conclusions on the monitoring data and analysis of water quality of freshwater ponds as documented in:

- *Brewster Freshwater Ponds: Water Quality Status and Recommendations for Future Activities* dated 2009, prepared by Coastal Systems Group, School for Marine Science and Technology, University of Massachusetts Dartmouth and the Cape Cod Commission Water Resources Program;
 - *Evaluation of Methods to Control Phosphorus in Areas Served by Onsite Septic Systems* dated 2006, prepared by the Massachusetts Alternative Septic System Test Center of the Barnstable County Department of Health and Environment;
 - *The Massachusetts Buffer Manual* dated 2003 prepared by the Berkshire Regional Planning Commission;
 - Response Curves for Phosphorus Plume Lengths from Reactive-Solute-Transport Simulations of Onland Disposal of Wastewater in Noncarbonate Sand and Gravel Aquifers dated 2004 and prepared by the U.S. Geological Survey; and
 - *Integrated Water Resources Management Plan – Phase II* by Horsley Witten Group, Inc. dated January 2013
- 1.3 In accordance with Massachusetts General Laws, Chapter 111, Section 31 and 127A, as amended, and for the protection of public health and the environment, the Brewster Board of Health hereby establishes and adopts the following regulations, which supplement Massachusetts 310 CMR 15.000. This regulation supersedes and replaces the Leaching Facility Setback regulation which took effect on September 1, 2006.

2. Applicability

This regulation shall apply to existing and proposed subsurface sewage disposal systems located in proximity to Brewster surface waters, including lakes and ponds, as described below. For any use subject to this regulation, garbage disposals are not allowed and only phosphate free (less than 0.5% phosphorous) dishwashing detergents, soaps and cleaners shall be discharged to the system.

3. Definitions

B Horizon: The B Horizon is the shallow layer of soil directly below the top soil where there are greater concentrations of iron and manganese that can uptake significant quantities of phosphorus from septic system effluent, such that it will not migrate as quickly to a lake or pond. The B Horizon is the soil horizon that formed below an A, E, or O horizon and is dominated by obliteration of all or much of the original rock structure and shows one or more of the following:

1. Illuvial concentration of silicate clay, iron, aluminum, humus, carbonates, gypsum, or silica, alone or in combination;
2. Evidence of removal of carbonates;
3. Residual concentration of sesquioxides;
4. Coatings of sesquioxides that make the horizon conspicuously lower in value, higher in chroma, or redder in hue than overlying and underlying horizons without apparent illuviation of iron;
5. Alteration that forms silicate clay or liberates oxides or both and that forms granular, blocky, or prismatic structure if volume changes accompany changes in moisture content; or
6. Brittleness.

Downgradient: Of or pertaining to the place(s) downstream of a lake or pond through which groundwater flows.

Lake: Any open body of fresh water with a surface area of 10 acres or more, and shall include great ponds. The limit of a lake or great pond is defined by the landward extent of the bordering vegetated wetlands that surround it or by the mean high water mark if bordering wetlands are absent as confirmed by the Conservation Commission.

Leaching Facility: A system of trenches, galleries, chambers, pits, field(s) or bed(s) together with effluent distribution lines and aggregate which receives effluent from a septic tank or treatment system.

Minimum Demand Dose Volume: The volume of effluent pumped during each dosing of a pressure dosed leaching facility. The minimum demand dose volume is between five and ten times the volume of the distribution laterals as further described in the Title 5 Pressure Distribution Design Guidance developed by the Massachusetts Department of Environmental Protection.

Non-Compliant System: For the purposes of this regulation a non-compliant system is a sewage disposal system leaching facility that:

- does not conform to the requirements of 310 CMR 15.000, or:
- is located within the upgradient 300-foot buffer of a lake or pond or the downgradient 100-foot buffer of a lake or pond, or:
- is located within 100 feet of any surface water other than a lake or pond.

Pond: Any open body of fresh water with a surface area of less than 10 acres, either naturally occurring or man-made by impoundment, which is never without standing water due to natural causes, except during periods of extended drought. For purposes of this definition, extended drought shall mean any period of four or more months during which the average rainfall for each month is 50% or less of the ten year average for that same month. Basins or lagoons which are part of wastewater treatment plants shall not be considered ponds, nor shall swimming pools or other impervious man-made retention basins. The limit of a pond is defined by the landward extent of bordering vegetated wetlands that surround it or by the mean high water mark if bordering vegetated wetlands are absent **as confirmed by the Conservation Commission**.

Setback Distance: For the purposes of this regulation, the required setback distance for a sewage disposal system leaching facility from any surface water (other than a lake or pond) is 100 feet. The setback distance from a lake or pond is 300 feet if a lot is upgradient of the lake or pond, and 100 feet if the lot is downgradient of the lake or pond.

Surface Water: As defined by **310 CMR** 15.000 Surface Waters include all waters other than groundwaters within the jurisdiction of the Commonwealth of Massachusetts, including, without limitation, rivers, streams, lakes, ponds, springs, reservoirs, impoundments, estuaries, wetlands, coastal waters and certified vernal pools.

Upgradient: Of or pertaining to the place(s) from which groundwater originated or traveled through before reaching a lake or pond.

Vegetated Buffer: A protective strip of native plantings between a lake or pond and human activity that acts as a filter, capturing many of the pollutants from runoff.

4. Setback Distance for Surface Waters Other than Lakes and Ponds

Except as provided in Sections 5-10 set forth below, all new and replacement leaching facilities for sewage disposal systems in Brewster shall be located and installed more than 100 feet from any Surface Water, other than a lake or pond, including without limitation, rivers, streams, springs, reservoirs, impoundments, estuaries, wetlands, coastal waters, and certified vernal pools.

All leaching facilities of existing sewage disposal systems within 100 feet of such a surface water shall be considered to be non-compliant systems and shall be repaired to comply with this setback requirement at the time that any permit or system inspection is required by Title 5 (310 CMR 15.00). If an existing leaching facility is located on a lot where it cannot be moved beyond the 100-foot setback, the leaching facility must be located as far as possible from the surface water, subject to review and approval by the Board of Health.

5. Design Requirements for Septic Systems Within 100 feet Downgradient and 300 feet Upgradient from a Lake or Pond

The construction, upgrade, or expansion of all septic systems within 100 feet downgradient and 300 feet upgradient of a lake or pond must comply with the requirements in Sections 6-9 below. For most lakes and ponds, a determination can be made as to whether a lot is downgradient or upgradient of any lake or pond by referencing the map titled Septic System Buffers and Groundwater Flow Directions near Brewster's Ponds, dated January 26, 2016. A copy of this map is on file at the Brewster Board of Health Office at 2198 Main Street, Brewster, Massachusetts.

Where the setback to a lake or pond has not been mapped, it is assumed that the 300-foot upgradient setback applies around the lake or pond shore. Also, for lots adjacent to very small ponds where the upgradient and downgradient shorelines have not been mapped by the town and for lots that straddle the downgradient/upgradient boundary, the lot is considered to be upgradient and the 300-foot setback applies. A lot owner may challenge this determination by hiring a Registered Professional Engineer (P.E.) or qualified Hydrologist or Hydrogeologist whose qualifications are acceptable to the Brewster Board of Health to conduct an onsite hydrologic assessment that clearly demonstrates to the satisfaction of the Board of Health that the lot in question is indeed downgradient of the lake or pond.

6. Setback Distances

6.1 New Construction

6.1.1 All new sewage disposal system leaching facilities for new construction shall be located or installed at a distance greater than 100 feet downgradient or greater than 300 feet upgradient from all lakes and ponds.

6.1.2 If a developable lot was in existence prior to the effective date of this regulation, new construction of a sewage disposal system leaching facility may be permitted within the setback distances specified in Section 6.1.1 above by the Board of Health so long as the applicable design, treatment and best management requirements in Section 8 are met.

6.2 Expansions in Use

For existing leaching facilities within 100 feet downgradient or 300 feet upgradient of a lake or pond, no change in use or change or addition to the structure that would increase the design flow is allowed unless it is demonstrated successfully by the applicant that all applicable design, treatment and best management requirements in Section 8 are met.

7. Upgrade of Non-Compliant Systems

All leaching facilities of existing sewage disposal systems within 300 feet upgradient of a lake or pond and 100 feet downgradient of a lake or pond shall be considered to be non-compliant systems and shall be repaired to meet the applicable design, treatment and best management

requirements in Section 8 at the time that any permit or system inspection is required by Title 5 (310 CMR 15.00).

8. Design and Treatment Standards

For septic systems located within 300 feet upgradient of a lake or pond, the property owner must elect to upgrade their system using either the leaching facility design standards in Section 8.1 or the effluent treatment standards in Section 8.2. Property owners for all systems within 300 feet upgradient of a lake or pond whose lot includes direct lake or pond frontage of 20 feet or more must also maintain or install a vegetated buffer as defined in Section 8.3.

For septic systems with the leaching facility located within 100 feet downgradient of a lake or pond where it cannot be moved beyond the 100 foot setback, the leaching facility must be located as far as possible from the lake or pond, subject to review and approval by the Board of Health.

For septic systems within the 100-foot **downgradient** setback on lots that include direct lake or pond frontage of 20 feet or more the property owner must maintain or install a vegetated buffer as defined in Section 8.3.

8.1. Leaching Facility Design Standards

If a property owner elects to follow the leaching facility design standards they must comply with the following design requirements.

- (a) A five-foot separation between the bottom of the leaching facility and the estimated seasonal high groundwater table shall be maintained
- (b) The leaching facility shall be comprised of either pressure-dosed narrow trenches or drip irrigation lines. In either case, the leaching facility will be designed such that the soil B horizon will accept effluent from the leaching facility. **Pressure dosed systems shall be designed to receive the minimum demand dose volume. Timed dosing is preferred over demand dosing to help insure the maximum uptake of phosphorus.**
- (c) Trenches and irrigation drip lines shall be aligned perpendicular to the general direction of groundwater flow. Groundwater flow may be determined by referencing the map titled Septic System Buffers and Groundwater Flow Directions near Brewster's Ponds, dated January 26, 2016. A copy of this map is on file at the Brewster Board of Health Office at 2198 Main Street, Brewster, Massachusetts.
- (d) The leaching facility will be positioned on the property such that is as far from the lake or pond's edge as possible.
- (e) **If the bottom of the leaching facility is ten feet or more above the estimated seasonal high water table, the property owner may claim a 15-foot horizontal setback credit.**

- (f) If the bottom of the leaching facility is twenty feet or more above the estimated seasonal high water table, the property owner may claim a 30-foot horizontal setback credit

8.2. Effluent Treatment Standards

If a property owner chooses to comply with the effluent treatment standards they must incorporate a phosphorus treatment system approved for use by the Massachusetts Department of Environmental Protection that will treat septic system effluent to a standard of 1 mg/L of total phosphorus or below. Compliance with the 1 mg/L standard must be measured at a point between the septic tank and the leaching facility. Monitoring must be conducted according to the requirements for the treatment system as approved by the Massachusetts Department of Environmental Protection

8.3. Vegetated Buffers

Property owners within the 300-foot upgradient or 100-foot downgradient buffer whose lot includes direct lake or pond frontage of 20 feet or more must install or maintain a vegetated buffer strip of native plantings to prevent phosphorus from entering the lake or pond as either contaminated runoff or leaf litter.

Vegetated buffer strips must be approved by the Brewster Conservation Commission and should have a minimum width of 50 feet. However, it may not be possible to install a 50-foot wide vegetated buffer on all developed water front lots and the applicant must work with the Conservation Commission to design and install a buffer that maximizes the protection of the adjacent lake or pond.

8.4 Pumping

All systems within 300 feet upgradient or 100 feet downgradient of a lake or pond must be pumped at least once every three years.

9. Composting

All outdoor composting for those properties subject to this regulation must occur at the greatest distance feasible from the lake or pond.

10. Variances

Variances and the variance approval process shall be governed by the Board of Health Regulation Regarding Variance Requests.

11. Appeal

Any person aggrieved by an order, variance, issuance or denial by the Board of Health may appeal to any court of competent jurisdiction as provided for by the laws of the Commonwealth of Massachusetts.

12. Enforcement

12.1 The Board of Health, its agents, officers and employees shall have the authority to enter upon privately owned land for the purpose of performing their duties for the administration and review of this regulation and may make or cause to be made such examination, surveys or sampling as the Board deems necessary.

12.2 The Board of Health shall have the authority to enforce these regulations by violation notices, administrative order and civil and criminal court actions.

12.3 Any person who shall violate any provision of this regulation for which a penalty is not otherwise provided shall be subject to a fine of not more than \$200. Each day or portion thereof during which a violation occurs or continues shall constitute a separate offense.

13. Severability

Each section of these rules and regulations shall be construed as separate and to the end that if any section, item, sentence, clause or phrase shall be held invalid for any reason, the remainder of these rules and regulations shall continue in full force and effect.

14. Effective Date

This regulation shall take effect on XXXX.